

Appl. No. 09/196,013
Amdt. Dated May 19, 2004
Reply to Office Action of November 19, 2003

Attorney Docket No. 81784.0202
Customer No. 26021

REMARKS/ARGUMENTS

Claims 1, 3-5 and 7-30 are pending in the application. The following Remarks are made in response to the Final Office Action of November 19, 2003. No new matter is involved.

On page 2 of the Final Office Action, claims 1, 5, 9-15, 24-28 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,920,301 of Sakamoto, et al. in view of U.S. Patent 6,014,194 of Kuo, et al. On page 6 of the Final Office Action, claims 16, 17 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakamoto, et al. in view of Kuo, et al., and further in view of U.S. Patent 5,691,791 of Nakamura, et al. On page 7 of the Final Office Action, claims 19-23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakamoto, et al. in view of Kuo, et al. and further in view of U.S. Patent 5,646,643 of Hirai, et al. On page 9 of the Final Office Action, claims 3 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakamoto, et al. in view of Kuo, et al. and further in view of U.S. Patent 6,078,317 of Sawada. On page 9 of the Final Office Action, claims 4 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakamoto, et al. in view of Kuo, et al. and further in view of U.S. Patent 5,834,827 of Miyasaka, et al. These rejections are respectfully traversed.

Thus, claims 1, 5, 9-15, 24-28 and 30 are rejected on the combination of Sakamoto and Kuo. The remaining claims are rejected on such basic combination of references taken with various other references. Consequently, the combination of Sakamoto and Kuo is the basis for rejection of claims 1, 5, 9-15, 24-28 and 30, and forms the essence of the rejection of the other claims. However, the claims are submitted to clearly distinguish patentably over the attempted combination of Sakamoto and Kuo as well as the other attempted combinations involving additional prior art.

In Fig. 12 thereof, Sakamoto discloses processing of signals separately for R, G and B in a ferroelectric liquid crystal display. In other words, Sakamoto discloses a color display LCD in which a R signal, a G signal and a B signal are separately input into a frame memory 57 in a driver circuit module 71 and the R, G and B signals are separately processed. As conceded in the Office Action, Sakamoto does not have the intent to limit the upper limit values of the voltage ranges of the R, G, and B signals during the display period.

It is also stated on page 3 of the Final Office Action with respect to claim 24 that "Kuo et al. teaches at least the upper limit values for R and B light components differ from one another". However, Kuo only discloses, in Fig. 1 and in the corresponding description thereof, that a change in transmission of liquid crystal with respect to an applied voltage differs for each of R, G and B light components, and Kuo fails to disclose changing the upper limit value of the voltage to be actually applied. In fact, Kuo employs a method which is opposite to the process of the present invention.

More specifically, in Kuo, in order to obtain uniform optical characteristics for R, G and B, polymers which can be cross-linked by UV are added to the liquid crystal and an initializing voltage (cross-linking voltage) is applied to each of R, G and B pixel regions while irradiating UV ray, so that different polymer networks are formed within the LCD cells. Kuo describes that, with such a process, it is possible to obtain identical phase retardation caused in the liquid crystal for R, G and B. If the ultimately obtained phase retardation of the LCD cell is uniform for R, G and B, as described in Kuo, there is no need to change the drive voltage. In Kuo, an ultraviolet ray is actively irradiated to each pixel of each of R, G and B to alter the structure within the liquid crystal layer before the LCD cell is completed. In other words, it is clear that Kuo did not even contemplate employing a method for "independently controlling the upper limit values of R, G and B voltage signals"

to solve the problem that the electro-optical characteristics differ for R, G, and B and which was known to a person with ordinary skill in the art.

With respect to the references cited in addition to Sakamoto and Kuo, none of such references describe or even suggest actually controlling (limiting) the upper limit values of the voltage signal to be applied to a liquid crystal for each of R, G, and B. In other words, it is clear from such references that at the time the present invention was made, it was common knowledge for one of ordinary skill in the art to either alter the cell structure or to do nothing when the electro-optical characteristics differ for R, G, and B. Thus, there is no description or suggestion in such references that would motivate one of ordinary skill in the art to limit the upper limit values of the voltage signals for R, G, and B.

Consequently, the present invention is clearly not obvious in view of such references.

Again, claim 1 is submitted to clearly distinguish patentably over the attempted combination of Sakamoto and Kuo. Claim 1 defines a liquid crystal display in which "each of upper limit values of ranges for driving voltages respectively for R display, G display, and B display applied to the liquid crystal is set independently for R light, G light, and B light, without a control voltage applied to the substrates to control the intensity of R, G, and B light simultaneously". The display of claim 1 is further characterized by "an upper limit value for a range of values usable within an entire duration of display as driving voltages for respective R, G, and B light components is set independently for each of R, G, and B light components". Still further, the display of claim 1 is characterized by "among said independently set upper limit values for respective R, G, and B light components, an upper limit value for at least one of the colors differs from the upper limit values for the other colors". Similar comments apply to the other claims.

Appl. No. 09/196,013

Amdt. Dated May 19, 2004

Reply to Office Action of November 19, 2003

Attorney Docket No. 81784.0202

Customer No. 26021

In the case of claim 10, the Office Action states that the difference between applied voltages for the colors green and red is within 20%. However, claim 10 recites "the maximum difference among the set voltages stays within 20%". Stated another way, claim 10 describes that the maximum of the difference among the upper limit values to be set to each of R, G, and B is within 20%. Therefore, even if the difference in voltage showing the maximum transmission of G and R at 6.5 volts is 20%, as stated in the Office Action, it is clear that the difference between the voltage for obtaining the maximum transmission in B and the voltage of R or G exceeds 20%. In other words, Kuo describes that the maximum difference among R, G and B is not within 20% so that the rejection on this basis is not well founded. Claim 10 clearly distinguishes patentably over the attempted combination of references.

In conclusion, claims 1, 3-5 and 7-30 are submitted to clearly distinguish patentably over the cited references for the reasons set forth above. Therefore, reconsideration and allowance are respectfully requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6846 to discuss the steps necessary for placing the application in condition for allowance.

Appl. No. 09/196,013
Amdt. Dated May 19, 2004
Reply to Office Action of November 19, 2003

Attorney Docket No. 81784.0202
Customer No. 26021

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: May 19, 2004

By: 

John P. Scherlacher
Registration No. 23,009
Attorney for Applicant(s)

500 South Grand Avenue, Suite 1900
Los Angeles, California 90071
Phone: 213-337-6700
Fax: 213-337-6701